3. Additional Management Actions

The review of the available ambient numeric water quality monitoring data shows attainment of current water quality criteria for sediment and metals. Review of the biological data and sediment impacts to aquatic habitat indicates that the historical habitat conditions within SF Salmon Subbasin are in the process of re-establishing. These results of the SF Salmon SBA indicate that the listed water bodies currently meet the Idaho water quality standards for sediment and metals. The TMDL approved by the USEPA in 1991 included two surrogate targets, percent depth fines and cobble embeddedness. Data included in the document suggest that the watershed has attained the target and has an improving trend for cobble embeddedness, but has not attained the target for percent depth fines. Therefore, the IDEQ is removing all water bodies currently listed for sediment and metals from the Idaho 303(d) list with the exception of the mainstem South Fork Salmon River.

However, evidence remains that the existing road system contributes large quantities of sediment during storm events. These ongoing impacts to the water bodies, combined with the highly valued TES beneficial uses suggests that further implementation of the 1991 TMDL would be beneficial to prevent the existing roads and sediment sources from impacting current water quality. Therefore, the IDEQ is recommending additional actions be taken by the designated land management agencies to ensure the current water quality is protected and beneficial uses are supported in the future.

3.1 Existing USDA Forest Service Policies

The IDEQ intends the further TMDL implementation to be guided primarily by the existing and future policies adopted by the USDA Forest Service (FS). These policies include:

- National Forest Service Road Management Policy
- FS/BLM Protocol for Addressing Clean Water Act (CWA) 303(d) Listed Waters
- Clean Water Action Plan
- National Forest Service Total Maximum Daily Load Policy (date?)
- Water and The Forest Service
- Natural Resources Agenda
- Inner Columbia Basin Ecosystem Management Plan
- Pacfish/Infish Interim Strategies
- Intermountain West Water Initiative
- State Specific Requirements (i.e., Memorandums of Understanding)

National Forest Service Roads Policy

The National Forest Service Roads Policy (September 2000) requires the FS to undertake a scientifically based road analysis procedure, at appropriate scales and coordinated with other ecosystem analyses, to make better decisions regarding road management.

Key features of the policy are:

1. Conduct and complete extensive analysis and public involvement at the local level, resulting in a forest road system that serves resource objectives and public uses of national forest lands as identified in forest plans (e.g., the SW Idaho 3 Forest Plan for the Payette, Boise, and Salmon Forests).
2. Carefully consider and screen proposals to build new roads. Decisions to build new roads will consider available funds for maintenance and operation and the latest scientific information on the effects of roads on ecosystems.
3. Maintain and reconstruct needed roads. Give funding and management priority to most heavily used roads to provide safe travel and reduce adverse environmental impacts.
4. Following analysis and public involvement at the local level, decommission or convert unneeded roads to other uses.

Until a science based road analysis is incorporated into forest plans, the following transition criteria shall apply:

- Roadless and un-roaded areas: proposals for road construction or reconstruction must demonstrate a compelling need…and will be shaped by a roads analysis and EIS.
- Roaded areas: Projects currently underway are exempt from roads analysis, but will be subject to typical analysis under NEPA, ESA, CWA, and other laws and regulations.

One example of an acceptable process is the "Roads Analysis: Informing Decisions About Managing the National Forest Transportation System" (see: www.fs.fed.us/news/roads).

FS / BLM Protocol for Addressing CWA 303(d) Listed Waters

It is the responsibility of the Forest Service and Bureau of Land Management through implementation of the Clean Water Act, to protect and restore the quality of public waters under their jurisdiction. The purpose of the FS/BLM Protocol for Addressing CWA 303(d) Listed Waters (May 1999) is to provide a consistent mechanism for the FS and BLM to meet this responsibility, bring waters into compliance within a reasonable timeframe, and support State development of TMDLs. Signatures include FS, BLM, and EPA executives for Idaho, Oregon, Montana, and Washington. Additional letters clarifying applicability of the Protocol for Idaho and Montana were written in late summer and fall of 1999. The protocol includes 4 main sections: (1) two goals, (2) a seven component overarching strategy, (3) a four-step decision framework, and (4) linkages to other planning and analysis processes.

Clean Water Action Plan

The Clean Water Action Plan (CWAP; February 1998) was signed into policy by nine Federal departments, including the Department of Agriculture. The FS is a primary signatory and much of the implementation involves or includes FS actions. There are 10 primary implementation principles, and 110 action items. Some of the main actions that parallel and re-enforce direction and policy in the Protocol, and Natural Resources Agenda include: The Unified Watershed Assessment process, the Watershed Restoration Action Strategies, the

Unified Federal Policy. The Forest Service is actively working to develop a prioritization process that will fulfill commitments under the CWAP.

National Forest Service TMDL Policy

The National Forest Service TMDL Policy (August 1999) provides the guidance for fulfilling FS responsibilities for Key Action 100 of the CWAP. The FS was originally chartered to protect and improve watersheds to achieve favorable conditions of water flow (Organic Act, 1897). Through science-based experience the FS considers the most effective means for controlling the generation of nonpoint source pollution is by applying preventative and restorative watershed management practices, these practices are designed and adapted as needed to increase their effectiveness in achieving water quality goals. Under this policy, the FS is to participate with states, tribes, private land owners, and the USEPA in the preparation and implementation of TMDLs and to encourage and assist States, tribes, and the USEPA to develop and implement effective programs for controlling nonpoint sources of pollution.

Water and the Forest Service

The Water and the Forest Service report (January 2000) focuses on the role of forests in water supply, including quantity, quality, timing, etc. This report re-enforces the need to collaboratively protect and restore watershed condition. The report states that the Forest Service will play a major role in improving the ability of policymakers, managers, and citizens, to develop options, anticipate consequences and implications, and fashion responsive, informed programs.

Boise and Payette Forest Biological Assessment, June 2001

The biological assessment was developed to determine the effects of federal actions in the South Fork Salmon River on chinook salmon and their designated critical habitat, steelhead and their designated critical habitat, and bull trout. Such actions include, but are not limited to, timber sales, bridge relocation, road construction, grazing and prescribed burning. The biological assessment addresses direct and indirect effects as well as the cumulative effects of the proposed actions. Appendix C outlines the proposed actions and their effects in the upper and lower SF Salmon River.

Natural Resources Agenda

The Natural Resources Agenda (1998) refocuses the Forest Service on its original purpose, established under the Organic Act. This agenda, adopted by the Chief of the Forest Service, is highly parallel and re-enforces the policy in the CWAP.

Interior Columbia Basin Ecosystem Management Plan

The Interior Columbia Basin Ecosystem Management Plan (ICBEMP; DSEIS, Spring 2000; FEIS, Fall 2000) is the largest, most comprehensive ecosystem management plan in the country. It would replace Pacfish/Infish, and be the basis for all forest plan revisions in

Idaho. It has been over six years in the making. It includes direction for subbasin and watershed assessment, prioritization, protection and restoration, in collaboration with other agencies and stakeholders.

Pacfish Interim Strategy, Infish, and Biological Opinions for TES

The Pacfish Interim Strategy (February, 1995), Infish, and Biological Opinions for TES were to be interim until the completion of ICBEMP. Goals and direction in Pacfish, and its companion document Infish and subsequent Biological Opinions and agreements with NMFS and FWS, apply to areas that support anadromous and inland fisheries. Goals and direction include water quality and roads as well as riparian management prescriptions. Specifically, this strategy is intended to maintain or restore stream channel integrity, channel processes and the sediment regime under which the riparian and aquatic ecosystems developed. Direction aimed at road management includes standards that avoid adverse effects on listed anadromous fish.

Intermountain West Water Initiative

The Intermountain West Water Initiative (IWWI) was initiated to gather and use information about resource conditions, water rights, and social patterns to make strategic decisions that will best protect and restore watershed, aquatic, and riparian resources on FS lands in the Inland West. The IWWI information is needed to answer four strategic questions identified by the Regional Foresters in the inland west (Forest Service Regions 1-4):

- Where are the critical resource values we need to protect?
- Where are the damaged resource values we need to restore?
- Where should we act first?
- With whom should we act in partnership?

This process is similar to direction issued under the Northwest Forest Plan (NWFP) for Oregon, Washington, and Northern California. Specifically, the NWFP identifies a process called an "Ecosystem Analysis at the Watershed Scale" (EAWS). This process is used to assess watershed condition, capabilities, and prioritize ecosystem risks and opportunities for protection and restoration.

State Specific Requirements

As a designated Land Management Agency the Forest Service has entered into a Memorandum of Understanding (MOU) between the EPA and various State of Idaho agencies (IDHW, 1993). Within the Forestry Practices Appendix to this MOU, federal agencies have agreed to comply with the water quality protection provisions of the Idaho Forest Practices Act Rules and Regulations.

Additional federal agency responsibilities are also defined in 40 CFR Part 130 as needing to comply with State requirements to control water pollution to the same extent as private entities. Existing authorities and programs for assuring implementation of BMPs to control nonpoint sources of pollution in the State of Idaho include:

State Agricultural Water Quality Program
Wetlands Reserve Program
Environmental Quality Improvement Program
Idaho Forest Practices Act
Water Quality Certification for Dredge and Fill
Non-point Source 319 Grant Program
Conservation Reserve Program
Resource Conservation and Development
Agricultural Pollution Abatement Plan
Stream Channel Protection Act

3.2 1991 TMDL Implementation

The current water quality assessment for the SF Salmon Subbasin indicates that additional actions must be taken by the designated land management agencies to ensure water quality standards are attained and beneficial uses are supported in the future. In addition, water quality monitoring must occur on a basis deemed appropriate to gauge further movement toward the 1991 TMDL targets.

Additional steps to ensure continued water quality improvement through implementation include:

- A detailed summary of the current status of the road system (or a schedule for obtaining this information);
- Specific road management activities to ensure storm drainage through the road system that utilizes natural hill-slope drainage features;
- A schedule and prioritization for accomplishing any required inventories and specific reconstruction or obliteration activities necessary to re-construct natural hill-slope drainage features;
- A discussion of the funding sources; and
- Document ongoing attainment of water quality standards.

These additional steps are the responsibility of stakeholders and the designated land management agencies.

4. Public Participation

4.1 Southwest Basin Advisory Group

Idaho Code Title 39, Chapter 36 and IDAPA 58.01.02.052 provides requirements for public participation in TMDL development and water quality decisions. Basin Advisory Groups (BAGs) and, if formed, Watershed Advisory Groups (WAGs) are to review the development of the SBAs and TMDLs, advise the state on impaired Water Bodies, the management of impaired watersheds, and recommend specific pollution control activities.

The Southwest Basin Advisory Group (SWBAG) was appointed by the Administrator of the Idaho Division of Environmental Quality in 1996 to fulfill the public participation requirements of Idaho Code 39-3601 *et seq.* Under Idaho Code 39-3615, the SWBAG is charged with providing advice to the IDEQ on the specific actions needed to control point and non-point source pollution impacting SF Salmon Subbasin water quality. Members selected for the SWBAG were recommended from nominations obtained from the local community to represent specific stakeholder groups within the watershed.

4.2 Public Notification

To meet the public review and participation requirements, the IDEQ completed the following steps:

- A 45 day comment period extends between December 22, 2000 and February 9, 2001.
- Public informational meetings to present the main findings of the draft document and to answer questions from the community include the IDEQ State Offices on January 9th, and Legion Hall in Cascade on January 10th, 2001
- Presentation of the Draft Subbasin Assessment to the SWBAG on January 4th, 2001 at the IDEQ Boise Regional Office.
- Published public notices provide information on the draft document findings, locations of available draft copies, directions for submitting written comments, IDEQ agency contacts, and notification of the public informational meetings in Boise and Cascade, ID. These notices were published in the Idaho Statesman, the Star News, the Valley Advocate, and the Salmon Recorder Herald.
- Copies of this document are available for review at IDEQ's Boise Regional Office; The State Public Library (Boise); the Boise National Forest (Boise); the Cascade Ranger District (Cascade); the Payette National Forest (McCall); and the Krassel Ranger District (McCall); or on IDEQ's web page: *www2.state.id.us/deq*.

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Glossary

305(b) Refers to section 305 subsection "b" of the Clean Water Act. 305(b) generally describes a report of each state's water quality, and is the principle means by which the U.S. Environmental Protection Agency, congress, and the public evaluate whether U.S. waters meet water quality standards, the progress made in maintaining and restoring water quality, and the extent of the remaining problems.

303(d) Refers to section 303 subsection "d" of the Clean Water Act. 303(d) requires states to develop a list of water bodies that do not meet water quality standards. This section also requires total maximum daily loads (TMDLs) be prepared for listed waters. Both the list and the TMDLs are subject to U.S. Environmental Protection Agency approval.

Anthropogenic Relating to, or resulting from, the influence of human beings on nature.

Anti-Degradation Refers to the U.S. Environmental Protection Agency's interpretation of the Clean Water Act goal that states and tribes maintain, as well as restore, water quality. This applies to waters that meet or are of higher water quality than required by state standards. State rules provide that the quality of those high quality waters may be lowered only to allow important social or economic development and only after adequate public participation (IDAPA 58.01.02.051). In all cases, the existing beneficial uses must be maintained. State rules further define lowered water quality to be 1) a measurable change, 2) a change adverse to a use, and 3) a change in a pollutant relevant to the water's uses (IDAPA 58.01.02.003.56).

Aquatic Occurring, growing, or living in water.

Aquifer An underground, water-bearing layer or stratum of permeable rock, sand, or gravel capable of yielding of water to wells or springs.

Assimilative Capacity The ability to process or dissipate pollutants without ill effect to beneficial uses.

Bedload Material (generally sand-sized or larger sediment) that is carried along the streambed by rolling or bouncing.

Beneficial Use	Any of the various uses of water, including, but not limited to, aquatic biota, recreation, water supply, wildlife habitat, and aesthetics, which are recognized in water quality standards.
Beneficial Use Reconnaissance Program (BURP)	A program for conducting systematic biological and physical habitat surveys of water bodies in Idaho. BURP protocols address lakes, reservoirs, and wadeable streams and rivers.
Benthic	Pertaining to or living on or in the bottom sediments of a water body.
Best Management Practices (BMPs)	Structural, nonstructural, and managerial techniques that are effective and practical means to control nonpoint source pollutants.
Best Professional Judgment	A conclusion and/or interpretation derived by a trained and/or technically competent individual by applying interpretation and synthesizing information.
Biomass	The weight of biological matter. Standing crop is the amount of biomass (e.g., fish or algae) in a body of water at a given time. Often expressed as grams per square meter.
Biota	The animal and plant life of a given region.
Biotic	A term applied to the living components of an area.
Clean Water Act (CWA)	The Federal Water Pollution Control Act (Public Law 92-50, commonly known as the Clean Water Act), as last reauthorized by the Water Quality Act of 1987 (Public Law 100-4), establishes a process for states to use to develop information on, and control the quality of, the nation's water resources.
Coliform Bacteria	A group of bacteria predominantly inhabiting the intestines of humans and animals but also found in soil. Coliform bacteria are commonly used as indicators of the possible presence of pathogenic organisms (also see Fecal Coliform Bacteria).
Conductivity	The ability of an aqueous solution to carry electric current, expressed in micro ( ) mhos/cm at 25 °C. Conductivity is affected by dissolved solids and is used as an indirect measure of total dissolved solids in a water sample.
Criteria	In the context of water quality, numeric or descriptive factors taken into account in setting standards for various pollutants. These factors are used to determine limits on allowable

	concentration levels, and to limit the number of violations per year. EPA develops criteria guidance; states establish criteria.
Cubic Feet per Second	A unit of measure for the rate of flow or discharge of water. One cubic foot per second is the rate of flow of a stream with a cross-section of one square foot flowing at a mean velocity of one foot per second. At a steady rate, once cubic foot per second is equal to 448.8 gallons per minute and 10,984 acre-feet per day.
Erosion	of humans in deforestation, cultivation of the land, overgrazing, and disturbance of natural drainages; the excess of erosion over the normal for an area (also see Erosion).
Decomposition	The breakdown of organic molecules (e.g., sugar) to inorganic molecules (e.g., carbon dioxide and water) through biological and nonbiological processes.
Depth Fines	Percent by weight of particles of small size within a vertical core of volume of a streambed or lake bottom sediment. The upper size threshold for fine sediment for fisheries purposes varies from 0.8 to 6.5 mm depending on the observer and methodology used. The depth sampled varies but is typically about one foot (30 cm).
Designated Uses	Those water uses identified in state water quality standards that must be achieved and maintained as required under the Clean Water Act.
Discharge	The amount of water flowing in the stream channel at the time of measurement. Usually expressed as cubic feet per second (cfs).
Dissolved Oxygen (DO)	The oxygen dissolved in water. Adequate DO is vital to fish and other aquatic life.
Disturbance	Any event or series of events that disrupts ecosystem, community, or population structure and alters the physical environment.
Endangered Species	Animals, birds, fish, plants, or other living organisms threatened with imminent extinction. Requirements for declaring a species as endangered are contained in the Endangered Species Act.
Environment	The complete range of external conditions, physical and biological, that affect a particular organism or community.

Erosion	The wearing away of areas of the earth's surface by water, wind, ice, and other forces.
Exceedance	A violation (according to DEQ policy) of the pollutant levels permitted by water quality criteria.
Existing Beneficial Use	A beneficial use actually attained in waters on or after November 28, 1975, whether or not the use is designated for the waters in Idaho's *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 58.01.02).
Exotic Species	A species that is not native (indigenous) to a region.
Feedback Loop	In the context of watershed management planning, a feedback loop is a process that provides for tracking progress toward goals and revising actions according to that progress.
Flow	See Discharge.
Fully Supporting	In compliance with water quality standards and within the range of biological reference conditions for all designated and exiting beneficial uses as determined through the *Water Body Assessment Guidance* (Grafe et al. 2000).
Geographical Information Systems (GIS)	A georeferenced database.
Ground Water	Water found beneath the soil surface saturating the layer in which it is located. Most ground water originates as rainfall, is free to move under the influence of gravity, and usually emerges again as stream flow.
Growth Rate	A measure of how quickly something living will develop and grow, such as the amount of new plant or animal tissue produced per a given unit of time, or number of individuals added to a population.
Habitat	The living place of an organism or community.
Headwater	The origin or beginning of a stream.
Hydrologic Basin	The area of land drained by a river system, a reach of a river and its tributaries in that reach, a closed basin, or a group of streams forming a drainage area (also see Watershed).

Hydrologic Cycle	The cycling of water from the atmosphere to the earth (precipitation) and back to the atmosphere (evaporation and plant transpiration). Atmospheric moisture, clouds, rainfall, runoff, surface water, ground water, and water infiltrated in soils are all part of the hydrologic cycle.
Hydrologic Unit	One of a nested series of numbered and named watersheds arising from a national standardization of watershed delineation. The initial 1974 effort (USGS 1987) described four levels (region, subregion, accounting unit, cataloging unit) of watersheds throughout the United States. The fourth level is uniquely identified by an eight-digit code built of two-digit fields for each level in the classification. Originally termed a cataloging unit, fourth field hydrologic units have been more commonly called subbasins. Fifth and sixth field hydrologic units have since been delineated for much of the country and are known as watershed and subwatersheds, respectively.
Hydrologic Unit Code (HUC)	The number assigned to a hydrologic unit. Often used to refer to fourth field hydrologic units.
Hydrology	The science dealing with the properties, distribution, and circulation of water.
LA	Load Allocation for non-point sources
Limiting	A chemical or physical condition that determines the growth potential of an organism. This can result in a complete inhibition of growth, but typically results in less than maximum growth rates.
Load Allocation (LA)	A portion of a water body's load capacity for a given pollutant that is given to a particular nonpoint source (by class, type, or geographic area).
Loading Capacity (LC)	A determination of how much pollutant a water body can receive over a given period without causing violations of state water quality standards. Upon allocation to various sources, and a margin of safety, it becomes a total maximum daily load.
Macroinvertebrate	An invertebrate animal (without a backbone) large enough to be seen without magnification and retained by a 500 m mesh (U.S. #30) screen.
Macrophytes	Rooted and floating vascular aquatic plants, commonly referred to as water weeds. These plants usually flower and bear seeds.

	Some forms, such as duckweed and coontail (*Ceratophyllum sp.*), are free-floating forms not rooted in sediment.
Margin of Safety (MOS)	An implicit or explicit portion of a water body's loading capacity set aside to allow the uncertainly about the relationship between the pollutant loads and the quality of the receiving water body. This is a required component of a total maximum daily load (TMDL) and is often incorporated into conservative assumptions used to develop the TMDL (generally within the calculations and/or models). The MOS is not allocated to any sources of pollution.
Mass Wasting	A general term for the down slope movement of soil and rock material under the direct influence of gravity.
Mean	Describes the central tendency of a set of numbers. The arithmetic mean (calculated by adding all items in a list, then dividing by the number of items) is the statistic most familiar to most people.
Meter	The basic metric unit of length: 1 meter '39.
Milligrams per Liter (mg/l)	A unit of measure for concentration in water, essentially equivalent to parts per million (ppm).
Monitoring	A periodic or continuous measurement of the properties or conditions of some medium of interest, such as monitoring a water body.
MOS	Margin of Safety. This accounts for any lack of knowledge concerning the relationship between pollutant loads and the water quality of the receiving water. The MOS is a required portion of the TMDL and is normally incorporated as conservative assumptions used to develop the TMDL.
National Pollution Discharge Elimination System (NPDES)	A national program established by the Clean Water Act for permitting point sources of pollution. Discharge of pollution from point sources is not allowed without a permit.
NTU	Nephelometric Turbidity Unit. A measure of stream turbidity
ORMV	Off Road Motor Vehicle
Parameter	A variable, measurable property whose value is a determinant of the characteristics of a system; e.g., temperature, dissolved

	oxygen, and fish populations are parameters of a stream or lake.
Phased TMDL	A total maximum daily load (TMDL) that identifies interim load allocations and details further monitoring to gauge the success of management actions in achieving load reduction goals and the effect of actual load reductions on the water quality of a water body. Under a phased TMDL, a refinement of load allocations, waste load allocations, and the margin of safety is planned at the outset.
Point Source	A source of pollutants characterized by having a discrete conveyance, such as a pipe, ditch, or other identifiable "point" of discharge into a receiving water. Common point sources of pollution are industrial and municipal wastewater.
Pollutant	Generally, any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems.
Pollution	A very broad concept that encompasses human-caused changes in the environment which alter the functioning of natural processes and produce undesirable environmental and health effects. This includes human-induced alteration of the physical, biological, chemical, and radiological integrity of water and other media.
Reach	A continuous unbroken stretch of river
Riparian Vegetation	Vegetation that is associated with aquatic (streams, rivers) habitats. Riparian vegetation is directly influenced by the hydrologic cycle of the system.
Runoff	The portion of rainfall, melted snow, or irrigation water that flows across the surface or through underground zones and eventually runs into streams.
Sediments	Deposits of fragmented materials from weathered rocks and organic material that were suspended in, transported by, and eventually deposited by water or air.
Settleable Solids	The volume of material that settles out of one liter of water in one hour.
Stream	A natural water course containing flowing water, at least part of the year. Together with dissolved and suspended materials,

	a stream normally supports communities of plants and animals within the channel and the riparian vegetation zone.
Subbasin	A large watershed of several hundred thousand acres. This is the name commonly given to 4th field hydrologic units (also see Hydrologic Unit).
Subbasin Assessment (SBA)	A watershed-based problem assessment that is the first step in developing a total maximum daily load in Idaho.
Subwatershed	A smaller watershed area delineated within a larger watershed, often for purposes of describing and managing localized conditions. Also proposed for adoption as the formal name for 6th field hydrologic units.
Threatened Species	Species, determined by the U.S. Fish and Wildlife Service, which are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
Total Maximum Daily Load (TMDL)	A TMDL is a water body's loading capacity after it has been allocated among pollutant sources. It can be expressed on a time basis other than daily if appropriate. Sediment loads, for example, are often calculated on an annual bases. TMDL = Loading Capacity = Load Allocation + Waste Load Allocation + Margin of Safety. In common usage, a TMDL also refers to the written document that contains the statement of loads and supporting analyses, often incorporating TMDLs for several water bodies and/or pollutants within a given watershed.
Tributary	A stream feeding into a larger stream or lake.
Turbidity	A measure of the extent to which light passing through water is scattered by fine suspended materials. The effect of turbidity depends on the size of the particles (the finer the particles, the greater the effect per unit weight) and the color of the particles.
Total Suspended Solids	The material retained on a 45-micron filter after filtration.
Waste Load Allocation (WLA)	The portion of receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. Waste load allocations specify how much pollutant each point source may release to a water body.
Water Body	A stream, river, lake, estuary, coastline, or other water feature, or portion thereof.

Water Quality	A term used to describe the biological, chemical, and physical characteristics of water with respect to its suitability for a beneficial use.
Water Quality Limited	A label that describes water bodies for which one or more water quality criterion is not met or beneficial uses are not fully supported. Water quality limited segments may or may not be on a 303(d) list.
Water Quality Management Plan	A state or area-wide waste treatment management plan developed and updated in accordance with the provisions of the Clean Water Act.
Water Quality Standards	State-adopted and EPA-approved ambient standards for water bodies. The standards prescribe the use of the water body and establish the water quality criteria that must be met to protect designated uses.
Water Table	The upper surface of ground water; below this point, the soil is saturated with water.
Watershed	1) All the land which contributes runoff to a common point in a drainage network, or to a lake outlet. Watersheds are infinitely nested, and any large watershed is composed of smaller "subwatersheds." 2) The whole geographic region which contributes water to a point of interest in a water body.
Wetland	An area that is at least some of the time saturated by surface or ground water so as to support with vegetation adapted to saturated soil conditions. Examples include swamps, bogs, fens, and marshes.
Young of the Year (YOY)	Young fish born the year captured, evidence of spawning activity.

Appendix A. Unit Conversion Chart

Table 33. Metric - English Unit Conversions

	English Units	Metric Units	To Convert	Example
Distance	Miles (mi)	Kilometers (km)	1 mi = 1.61 km 1 km = 0.62 mi	3 mi = 4.83 km 3 km = 1.86 mi
Length	Inches (in) Feet (ft)	Centimeters (cm) Meters (m)	1 in = 2.54 cm 1 cm = 0.39 in 1 ft = 0.30 m 1 m = 3.28 ft	3 in = 7.62 cm 3 cm = 1.18 in 3 ft = 0.91 m 3 m = 9.84 ft
Area	Acres (ac) Square Feet (ft^2) Square Miles (mi^2)	Hectares (ha) Square Meters (m^2) Square Kilometers (km^2)	1 ac = 0.40 ha 1 ha = 2.47 ac 1 ft^2 = 0.09 m^2 1 m^2 = 10.76 ft^2 1 mi^2 = 2.59 km^2 1 km^2 = 0.39 mi^2	3 ac = 1.20 ha 3 ha = 7.41 ac 3 ft^2 = 0.28 m^2 3 m^2 = 32.29 ft^2 3 mi^2 = 7.77 km^2 3 km^2 = 1.16 mi^2
Volume	Gallons (g) Cubic Feet (ft^3)	Liters (l) Cubic Meters (m^3)	1 g = 3.78 l 1 l = 0.26 g 1 ft^3 = 0.03 m^3 1 m^3 = 35.32 ft^3	3 g = 11.35 l 3 l = 0.79 g 3 ft^3 = 0.09 m^3 3 m^3 = 105.94 ft^3
Flow Rate	Cubic Feet per Second (ft^3/sec)[1]	Cubic Meters per Second (m^3/sec)	1 ft^3/sec = 0.03 m^3/sec 1 m^3/sec = ft^3/sec	3 ft^3/sec = 0.09 m^3/sec 3 m^3/sec = 105.94 ft^3/sec
Concentration	Parts per Million (ppm)	Milligrams per Liter (mg/l)	1 ppm = 1 mg/l[2]	3 ppm = 3 mg/l
Weight	Pounds (lbs)	Kilograms (kg)	1 lb = 0.45 kg 1 kg = 2.20 lbs	3 lb = 1.36 kg 3 kg = 6.61 kg
Temperature	Fahrenheit (°F)	Celsius (°C)	°C = 0.55 (F - 32) °F = (C x 1.8) + 32	3 °F = -15.95 °C 3 ° C = 37.4 °F

[1] 1 ft^3/sec = 0.65 million gallons per day; 1 million gallons per day is equal to 1.55 ft^3/sec.

[2] The ratio of 1 ppm = 1 mg/l is approximate and is only accurate for water.

Appendix B. 1991 South Fork Salmon River TMDL

South Fork Salmon River and Watershed

PROBLEM AT A GLANCE:		
Water Quality-limited?	Yes	
Segment identifiers:	PNRS # 918, 919, 920	
Pollutant of Concern:	Fine Sediment	
Uses Affected:	Salmonid Spawning	
Known Sources:	NPS – Forest Practices	

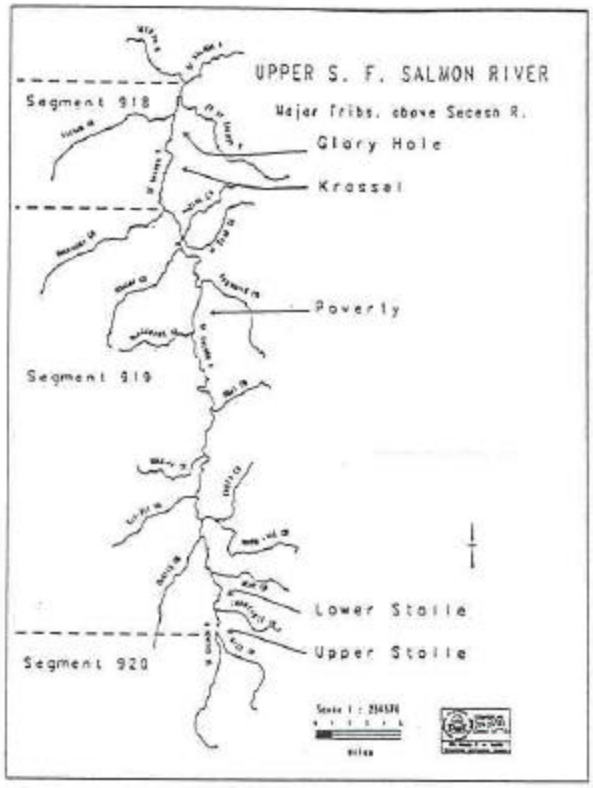
Background Information

The South Fork of the Salmon River (SFSR or South Fork) is located in the forested, mountainous area of central Idaho. The river and its tributaries flow on a granitic bedrock formation known as the Idaho Batholith. This landform is characterized by heavily dissected topography and highly erodible soils. Elevations range from 3,600 to 9,179 feet. Basin slopes are steep with many over 70%. The South Fork, between its headwaters and the confluence with the Secesh River drains 370 square miles (Figure 1).

Average annual precipitation varies with elevation from 20 to 60 inches per year. Since summers are warm and dry, most precipitation falls in the winter as snow. Winter and spring rain on snow events occur occasionally above 5,000 feet. The annual hydrograph reflects the winter precipitation pattern with snowpack accumulation and late spring snowmelt. Base flows occur in the fall and winter. The hydrograph rises to a peak in mid to late May and gradually declines to base flows by early September.

The area is primarily forested with ponderosa pine habitat types at the lower elevations grading through mixed coniferous types to subalpine fir habitat types at higher elevations. Meadows are found along the stream course, especially in its upper reaches (upper 919 and 920). Land use has been primarily for timber. Some mining development occurred in the past, but no active mines are working in the basin. Grazing activities have been removed from the basin. All but a few hundred acres are in federal or state ownership. The Boise and Payette National Forests are the primary land owners and managers.

Figure 1. South Fork Salmon River Drainage



Historically, the South Fork supported Idaho's largest run of summer Chinook salmon, estimated at approximately 10,000 returning adults. Prelogging runs of returning steelhead have been estimated at 3,000 adults. Spawning sites on the South Fork are primarily limited to the upper 35 miles. Most of the length of this channel occurs on gradients too high to support required conditions. Critical areas for salmonids, i.e. where local channel morphologies are conducive to spawning, include five primary sites (figure 1): Glory Hole, Krassel, Poverty Flats, Upper Stolle and Lower Stolle Meadows.

Early roads penetrated the S.F. Salmon River basin during the 19th century. The SFSR road was pioneered by the CCC during the 1930's. Road building associated with timber harvest increased in the 1950's and early 1960's. In the early 1960's a large area of the canyon and adjacent slopes was burned by wildfire (Poverty Burn). As mitigation, the Forest Service benched large areas of the burn. During the winter of 1964-65, a series of rain on snow events occurred in the basin. Road fills on unstable slopes and benched areas in the Poverty Burn saturated and failed with resulting massive sedimentation of the river (Platts and Megahan, 1975).

Problem Description

According to the Idaho Department of Health and Welfare, Division of Environmental Quality, the upper South Fork is water quality limited due to fine sediment. Fine sediment reduces the quality and quantity of spawning, rearing, and over-wintering areas for fish species dependent upon clean gravel. This reach of the South Fork has three water quality limited segments which are listed in Table 1.

Table 1. S.F. Salmon River Segments

PNRS	Boundaries	*Area Drained (km2)*
920	*Headwaters to Rice Creek*	*113.3*
919	*Rice Creek to Buckhorn Creek*	*722.7*
918	*Buckhorn Creek to Secesh River*	*123.5 (excluding RFDFSR)*

Applicable Water Quality Standards:

Appendix A describes applicable portions of Idaho's water quality standards related to fine sediment as well as efforts of a consensus team towards defining criteria for the South Fork. The following sections further summarize this information.

Beneficial Uses Affected:

The South Forks most impaired beneficial use is spawning for summer Chinook salmon. The sedimentation which was initiated in the 1964-65 rain on snow events inundated the Poverty Flats, Krassel, and Glory Hole spawning sites with course to fine sediments. Spawning sites, because of their low gradient, also function as areas of materials. Fine sediment affects spawning success by filling spaces between rocks and gravel that can smother eggs and trap fry attempting to emerge. As a result, Chinook and steelhead spawning numbers on the South Fork have declined.

Sediment also limits aquatic invertebrate populations used as a food source by predatory fish in rearing areas. The possibility exists that salmonid rearing maybe impaired on sections of the South Fork. However, results of studies using cobble embeddedness as a measure of living space have produced conflicting interpretations on the impairment of juvenile rearing. (Platts, et.al, 1989; Ries and Burns, 1989).

The beneficial uses believed to be impaired by sedimentation of the SFSR are salmonid spawning and possibly the salmonid rearing component of cold water biota. Percent fines by depth can effect intergravel dissolved oxygen and alevin emergence from the redd. Although percent fines by depth measures a parameter directly related to sedimentation, the parameters directly effecting spawning success are intergravel oxygen levels and alevin escapement. New techniques can measure these parameters and relate them directly to percent fines in the spawning gravels (Burton, et.al. 1990). Cobble embeddedness has been measured using theBurns methodology (Burns, 1984). The Boise and Payette National Forests continue to use the Burns method augmented by a 30 random hoops method

used to relate free-matrix particles and surface fines to cobble embeddedness (Payette National Forest, 1991).

Water Quality Criteria:

A consensus team working on the Payette National Forest Plan set interim water quality criteria for the SFSR and its tributaries (Appendix B). Cobble embeddedness as measured by the Burns technique (Burns, 1984) was set at a five year mean below 32% with no individual year above 37%. Percent depth fines as measured with a McNeil core and percent fines by weight analysis was set at less that 37% with no individual year over 29%. These criteria were set prior to recent research results that indicate intergravel fine sediment in spawning gravels is significantly different that in spawning egg pockets (Chapmen, 1988). They also predate development of methodologies which mimic egg incubation and alevin emergence *insitu* and measure intergravel dissolved oxygen levels (Burton, et.al., 1990). The new methodologies could be adapted into specific criteria, which set a certain level of spawning success (alevin emergence) and intergravel dissolved oxygen level.

Available Monitoring Data:

The SFSR and its tributaries have been monitored extensively since 1965 (Appendix B). Sediment yield from surface erosion has been monitored by Megahan and associated (1980) and the Boise National Forest (unpublished data). Surface fines and percent depth fines have been monitored over a similar period by Platts and associates (1989), and Ries and Burns (1989). Sediment yield peaked above 20,000 m^3/ year with an estimated $2x10^6 m^3$ delivered to the river channel. By 1980, sediment yield declined to 3,000-4,000 m^3/year. After inundation of the gravels with fine sands, the river began to carry the bedload downstream. Surface and septh fines declines until 1977, but have remained constant except for a slight increase in the early 1980's. Surface fines currently are between 10-15%, while depth fines are between 30-36%. Cobble embeddedness data has been collected for a much shorter period. These values vary between 14-56% (Platts, et.al., 1989; Ries and Burns, 1989; Boise National Forest, 1990). The cobble embeddedness data was collected in separate locations and with varied techniques.

The SFSR Monitoring Committee developed sediment load, depth fines and cobble embeddedness data over several years. The committee was composed of agency personnel from the Boise and Payette National Forests and the Intermountain Research Station. The monitoring tasks started by this group have been assumed by the Forests as part of their monitoring plans after their forest plans were implemented (Boise National Forest, 1990; Payette National Forest, 1990).

Parameters of Concern:

The beneficial uses believed to be impaired by sedimentation of the SFSR are salmonid spawning and possibly the salmonid rearing component of cold water biota. Percent fines by depth can effect intergravel dissolved oxygen and alevin emergency from the redd. Although percent fines by depth measures a parameter directly related to sedimentation, the

paramenters directly effecting spawning success are intergravel oxygen levels and alevin escapement. New techniques can measure these parameters and relate them directly to percent fines in the spawning gravels (Burton, et.al., 1990). Cobble embeddedness has been measured using the Burns methodology (Burns, 1984). The Boise and Payette National Forests continue to use the Burns method augmented by a 30 random hoops method used to relate free-matrix particles and surface fines to cobble embeddedness (Payette National Forest, 1991).

Pollutant Sources:

The SFSR basin above the Secesh River confluence is primarily National Forest System land. No point sources are present. Nonpoint sources of sediment are the primary water quality concern. The National Forests have estimated pollutant sources for the South Fork above Glory Hole (approximately 3 miles above the Secesh confluence). The following estimates were produced from the BOISED model and the professional judgement of individuals having years of experience observing sedimentation processes in the river basin (Megahan, personal communication).

SOURCE	SEDIMENT DELIVERED	OF TOTAL PERCENT
SFSR road (Warm Lake road to EF SFSR):	500 tons/yr	2.7%
SFSR ROAD (Warm Lake road to Cupp Cor):	50 tons/yr	.3%
Other open roads/closed roads/logging	2000 tons/yr	10.8%
Grazing	0 tons/yr	0%
Poverty Burn Benches	100 tons/yr	.5%
Natural Sources	15,900 tons/yr	85.7%

Actions to Date:

Several sediment control measures have been undertaken and continue to be attempted in the SFSR basin. The ground disturbing activity moratorium imposed for two periods has been the most comprehensive effort to limit sedimentation if the river. A number of rehabilitation projects have been completed. Dragline removal of sand from some pools and gravel cleaning have been attempted in stream. Attempts to stabilize cuts and fills on the SFSR road have involved retaining walls, mulching and grass seeding. Logging roads have been closed and reclaimed by ripping and grass seeding. Several rehabilitation projects have been completed (Table 2). These cover in excess of 350 acres. Rehabilitation of recent fires has included water barring fire line, grass seeding and contour felling of trees. The most recent mitigative action proposed is to pave the SFSR road between Warn Lake road and East Fork SFSR road with intensified cut and fill slope stabilization and relocation of a four mile segment of the road.

Table 2. Watershed Improvement Projects Completed in the South Fork Salmon River by the Boise and Payette National Forests.

Project Name	**Acres**	**FY Completed**
Camp Creek	6	1982
S. Fork Sr Rd.	60	1990
Cougar Trail	13	1990
Martin Creek	60	1987
Fourmile Creek	3	1987
Poverty Burn	37	1989
Encroachment above Oxbow	2	1990
Blackmire Creek Trail	4	1990
Jackie Creek	100	1990
Poverty Burn	35	1990
Phoebe Creek	1	1990
Zena Creek Rd		1990
Curtis/Tyndal Road		1990
Eagle Rock Trail	5	1990
Buckhorn	10	1982
Whites Gully	6	1990
Krassel Station	6	1990
Indian Creek	6	1990
Total Acres	*354*	

The Payette and Boise National Forest Plans currently prohibit all but minor ground disturbing activities, while permitting activities designed to reduce sedimentation to or sediments in the river. The plans provides for a resumption of ground disturbing activities, if a five year trend of improving sediment conditions can be established.

Pollution Control Strategy:

Sediment input from human activities must be reduced to have some expectation of fully recovering the salmonid spawning and cold water biota uses of the SFSR. A TMDL should identify the level of sediment reduction desired and practical, prescribe projects to attain that reduction in a reasonable compliance schedule and monitor the implementation of projects, sediment reductions and status of beneficial uses. Monitoring will assure that required plans are implemented, load reductions are realized and the beneficial uses are improved. Monitoring results will guide additional actions which may be required. The measures the strategy would require are all within the scope of the existing Boise and Payette Forest Plans. Implementation can occur without amendment of the plans.

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APPENDIX A

APPLICABLE WATER QUALITY STANDARDS

The South Fork of the Salmon River, between its headwaters and the confluence with the Secesh River, has been designated as water quality-limited. The pollutant of concern is fine sediment. Within the State of Idaho, water quality standards are published pursuant to Section 39-105 if the Idaho Code. Authority to adopt rules, regulations, and standards as are necessary and feasible to protect the environment and health of the citizens of the State is vested in the Board of Health and Welfare pursuant to Section 39-107, Idaho Code. Through the adoption of water quality standards, Idaho has defined the beneficial uses to be protected in each of its drainage basins and the criteria necessary to protect these uses.

Beneficial Uses Affected

The designated uses for the South Fork are found in Idaho's water quality standards (IDAPA 16.01.2130). These are listed as domestic water supply, agricultural water supply, cold water biota, salmonid spawning, and primary & secondary contact recreation. The beneficial uses found to be most adversely affected in the latest statewide water quality assessment are3 salmonid spawning and cold water biota.

Sediment has infiltrated or covered most of the gravels historically used for spawning. Although the specific effects on fish populations in the South Fork are of scouring and depletion of oxygen, and trap emergent fry in the gravels where eggs are deposited. Rearing and over-wintering areas in the South Fork and mainstem tributaries have also been degraded by sediment. Young fish are dependent upon pools and pockets between rocks and boulders to protect them from predators and to rest from swimming in fast currents. Spaces between rocks and gravel also support aquatic organisms used by fish as a food source. Sediment has filled many pools and spaces between rocks, eliminating much of the habitat needed by newly emergent fry.

Applicable Water Quality Criteria

The general water quality criteria state that "waters of the state must not contain:… Sediment in quantities specified in Idaho Department of Health and Welfare Rules and Regulation Section 10.02250, or, in absence of specific sediment criteria, in quantities which impair beneficial uses". For salmonid spawning and cold water biota, no specific numeric sediment criteria have been established. However, because of the recognized problems associated with the excess sediment in the South Fork, interim water quality criteria have been set by a consensus team working on the Boise and Payette nation Forest Plans.

"Standards and Guidelines for the South Fork Salmon River Drainage" have been specifically identified in both the Boise and Payette national Forest Plans. The stated "interim objective is to **provide habitat** sufficient to support fishable populations of naturally spawning and rearing salmon and trout by 1997. This determination will be based on evaluation of fish populations, harvest of wild fish, cobble embeddedness, core sampling,

photographs, and other data as may be pertinent. Data must result in a general acceptance that habitat is sufficient to sustain naturally producing populations which can tolerate sustained harvest of salmon and steelhead. A tentative interpretation of the interim objective, which does not define fully restored habitat, is that:

1. Photographs should demonstrate that the river is improving as evidenced by characteristics, such as dunning and stringing sand, changing from the existing condition toward conditions more similar to these found in Chamberlain Creek, central reaches of the Secesh River, and other appropriate streams.

2. In locations where cobble embeddedness now exceeds 32 percent, a five-year mean of $\leq$32% and no individual year $\geq$ 37% must be observed. Other locations must exhibit no increase sediment deposition outside natural variation.

3. In locations where percentage fine sediment now exceeds 27%, a five-year mean of $\leq$27% and no individual year $\geq$29% must be observed. Other locations must exhibit no increased sediment deposition outside natural variation."

The method used to measure cobble embeddedness is based on the Burns technique (Burns, 1984). Percent depth fines are based on methods using a McNeil core. These criteria were set prior to recent research results that indicate intergravel fine sediment in spawning gravels is significantly different than in spawning egg pockets (Chapman, 1988). They also predate development of methodologies which mimic egg incubation and alevin emergence *in-situ* and measure intergravel dissolved oxygen levels (Burton et.al., 1990). The new methodologies could be adapted into specific criteria, which set a certain level of spawning success (alevin emergence) and intergravel dissolved oxygen level.

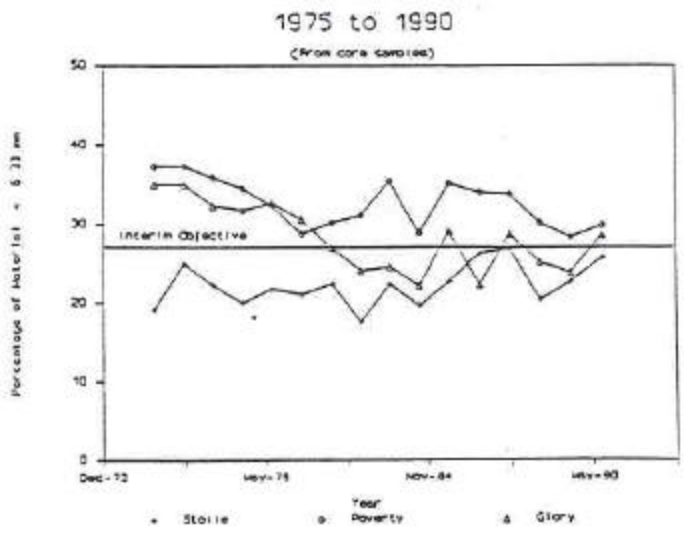
APPENDIX B

AVAILABLE MONITORING DATA

The SFSR and its tributaries have been monitored extensively since 1965. Sediment yield from surface erosion has been monitored by Megahan and associates (1980) and the Boise National Forest (unpublished data). Surface fines and percent depth fines have been monitored over a similar period by Platts and associates (1989), and Ries and Burns (1989). Sediment yield peaked above 20,000 m^3/year with an estimated $2x10^6 m^3$ delivered to the river channel. By 1980, sediment yield declined to 3,000-4,000 m^3/year. After inundation of the gravels with fine sands, the river began to carry the bedload downstream. Surface and depth fines declined until 1977, but have remained constant except for a slight increase in the early 1980's. Surface fines currently are between 10-15%, while depth fines are between 20-36%. Cobble embeddedness data has been collected for a much shorter period. These values vary between 14-56% (Platts et. al., 1989; Ries and Burns, 1989; Boise National Forest, 1990). The cobble embeddedness data was collected in separate locations and with varied techniques.

The SFSR Monitoring Committee developed sediment load, depth fines and cobble embeddedness data over several years. The committee was composed of agency personnel from the Boise and Payette National Forests and the Intermountain Research Station. The monitoring tasks started by this group have been assumed by the two forests as part of their monitoring plans after their forest plans were implemented (Boise National Forest, 1990; Payette National Forest, 1990).

Figure C-1. Percentage of Fines in South Fork Salmon River



Following steady sediment improvements in the late 1960's and early 1970's, core samples and embeddedness measurements show that there has been no improvement in fine sediments

in the South Fork in recent years. The values have fluctuated some from differences in water years and do not represent either an improving or declining trend. The following graphs illustrate the past sediment history in several important spawning areas in the South Fork Salmon River. The graphs show that the amount of fine sediment in these areas decreased sharply between 1966 and 1970 and leveled off after the mid-1970's. Additional sediment reduction is needed if the spawning areas are to improve any further.

Long term streamflow data has been monitored in the South Fork drainage near the Krassel Ranger station. Information from this site has been collected in conjunction with the U.S. Geological Survey (gage 13310700).

Sediment Loading Capacity:

The SFSR is believed to be at equilibrium between sediment influx and transport from the water quality limited segments (Platts, et. al. 1989; Platts and Megahan, 1975). Chinook, and to a lesser extent, steelhead spawning habitat has not attained pre 1964 spawning capabilities. Cobble embeddedness may be higher than pre 1964 levels. It is reasonable to expect spawning rearing habitat improvement only if sediment influx is reduced to permit the excess stream power the opportunity to remove stored sediment. The restoration projects outlined in Table 1 have been planned and scheduled by the Forest Service. Implementation of these projects would provide a estimated 25% reduction in the sediment load attributable to human activities. The goal of 25% reduction is attainable in a reasonable time frame and provides a starting point for a TMDL based on load reduction, monitoring of effectiveness and feedback of results for further load reduction decisions. The goal will be attained by sediment yield reduction projects associated with the SFSR road reconstruction project (Payette National Forest, 1990) and specific projects from the SFSR recovery plan (USDA, 1989).

TABLE 1. Sediment reduction projects providing an estimated 25% in yield.

	PROJECT	ESTIMATED (T/YR) YIELD REDUCTION	SCHEDULED IMPLEMENTATION
1	SFSR Road Reconstruction	150	1992
2	Close Miners Pk Road	83	1991
3	Temp. Closure of Buckhorn Road	200	1995
4	Curtis Cr. Drainage Spot Stabilization-Spur Rd. Oblitrtation	40	1994
5	Two-Bit, Six-Bit Loop Rd. Stabilization	55	1995
6	Upper SFSR Rd. (Kline Mt. Section) Obliteration/Spot Stabilization	54	1992
7	NF Dollar Cr. Rd. Obliteration/Stabilization	28	1993
8	Forest Highway 22 Fill Stabilization	12	1991
9	Road Closures in Upper SFSR	25	1992
	TOTAL	656	1996 Completion Date

Except for the SFSR road reconstruction project, these projects are drawn from the SFSR Recovery plan (USDA, 1989; Payette National Forest, unpublished planning documents). Sediment reduction estimates which are listed in Table 1 are estimates developed by techniques ranging from BISOED model runs to the best professional judgement of hydrology personnel. As the planning of the individual projects proceeds, more accurate estimates should be forthcoming. These estimates are the best available values at this time.

Funding levels and additional management factors could affect the ability of the Forest Service to implement these specific projects. Table 2 is a list of additional sediment reduction projects. Estimates of sediment reduction are not available for these projects. If monitoring results indicate that the 25% sediment reduction provided by the projects listed in Table 1 is insufficient to recover the beneficial uses, some or all of these projects could be implemented to attain further reductions. These projects may also be used to replace projects

on the Table 1 list. Replacement may proceed if accepted sediment reduction estimates indicate a comparable reduction to that of the replaced project.

TABLE 2. Additional Sediment Reduction Projects

	PROJECT	ACERAGE TO BE TREATED	SCHEDULED IMPLEMENTATION
1	Jakie Cr. Face	100	91-92
2	Martin Cr. Face	60	91-92
3	Poverty Burn	72	91-96
4	Indian Cr, Trail	6	91
5	Fitsum Cr,	10	95
6	Cougar Cr.	10	91
7	Blackmere Cr. Trail	5	91
8	White's Gully	2	91
9	Fitsum Cr. Road	25	91
10	Cougar Cr. Trail	3	92
11	Camp Cr.	10	93
12	Jakie Cr. Road Closure	30	91
13	Oxbow Beach	12	Unknown
14	Sediment removal in stream reaches with no spawning	50	91-96
15	Spot slide and gully stabilization	200	91-97
16	Bank failure below Jakie Cr. Bridge	1	91-93
17	Salmon Pt. Slide	5	91-95

When ground activity resumes (timber harvest and road building), BMP's will be required to guard against additional sedimentation. Since the SFSR is a forestry stream segment of concern in the state's antidegradation program, a local working committee would prescribe site specific BMP's of any forest practice. Any site-specific BMP's should have the goal of stringently minimizing additional sedimentation of the SFSR stream system.

Monitoring:

Effectiveness of the goal of 25% reduction in sediment yield from human activities will be established through monitoring. Implementation monitoring of the specific sediment reduction projects will be required. Site specific monitoring of pollution sources and pollution transport to the stream will be required. This monitoring will include tributary sediment monitoring (Megahan and Nowlin, 1976; Megahan, 1982) near the projects and photo-points to assess stabilization. The status of the beneficial use (salmon and steelhead spawning habitat capability) will be monitored at the five important spawning sites. Monitoring will include depth fines and other appropriate measures as intergravel dissolved oxygen, and egg incubation/alevin escapement in spawning habitat. Rearing habitat

capabilities will be monitored using cobble embeddedness protocols (Burns, 1984; Payette National Forest, 1991).

Depth fines and cobble embeddedness data will be collected by the Boise and Payette National Forests. The Division of Environmental Quality or its contractors will be responsible for linking depth fines and embeddedness data to support status of the beneficial uses.

First decade standards for beneficial use recovery will be:

> Five year mean of 27% depth fines by weight with no single year over 29%
> Five year mean of 32% cobble embeddedness with no single year over 37%
> or acceptable improved trends in other monitored water quality parameters directly related to salmonid spawning and cold water biota beneficial uses support.

These support criteria will be assessed and revised by 2001.

Monitoring of implementation, pollutant source and transport and beneficial use status will demonstrate the value of the implemented recovery plan projects. The effectiveness in lowering the sediment load to improve the limited beneficial uses in the SFSR will be assessed. If Chinook, steelhead and resident trout spawning capabilities increases to acceptable limits ny 2001 with an estimated 25% reduction of sediment yield from human activities, the level of effort expended to achieve the reduction would be maintained. If spawning capabilities does not increase, additional recovery projects and/or an analysis of the level of beneficial use attainability will be required. Additional projects would be aimed at further sediment source reduction.

Compliance Schedule:

Annual project accomplishment and monitoring results will be reported in the two Forest's monitoring results documents. All sediment reduction projects listed in Table 1 or equivalent projects will be completed by 1996. The interim goals for depth fines and cobble embeddedness or acceptable improving trends in other appropriate water quality parameters will be met by January 2001.

Special Provisions:

The Forest Service, Idaho Division Of Environmental Quality and Environmental Protection Agency will jointly work to secure the federal water pollution abatement funds necessary to complete the SFSR recovery projects required to meet the load reduction goal by 1996.

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Appendix C. Boise and Payette National Forest Bioassessments

This information was compiled from Payette National Forest Biological Assessment, Volume 24 (USDA, 2001)

Lower SFSR Subwatershed

1. Direct and Indirect Effects from Federal Actions

In this analysis area, eight programmatic actions, temporary actions related to the Mackay Bar hydro/irrigation diversion, and four outfitter/guide operations are considered. Effects from these federal actions to individual habitat indicators were assessed using the steelhead and bull trout matrices (Appendices 4 and 5). With the exception of the Mackay Bar federal action, the ongoing and new actions restore, maintain, or have no effect on each of the habitat indicators considered in the environmental baseline. For bull trout the actions would maintain or have no effect on subpopulation characteristics. In this analysis area, programmatic actions are expected to occur at a low level compared to other SFSR subwatersheds and other areas on the Forest because of the area's limited access and remote nature. Known, specific areas of potential effects to habitat indicators are addressed through specific mitigation items. The programmatic actions were reviewed, and mitigation added to address potential effects. No new ground disturbance is proposed, and no road construction. The scope of ongoing actions has not changed from previous consultations, so no new additional effects (except at the Mackay Bar diversion) to habitat indicators beyond those disclosed in previous BAs are expected. New flow and fish presence information for Smith Creek, in the vicinity of the Mackay Bar diversion, has lead to an analysis of additional effects.

Programmatic Action:

Fish habitat and riparian sampling (new action)
The potential effects of this action are disturbance of fish or eggs and redistribution of fine sediment within the substrate that could result in fine sediment deposition in redds. The potential area for these effects is localized around the areas where surveyors are working. The required mitigation measures are intended to prevent these effects from occurring in areas occupied by listed fish or eggs.

Miscellaneous forest products (ongoing, with previous consultation record)
The potential effects of this action are reduced large woody debris recruitment and increased sediment input, mainly from fuel wood harvest and accessing areas for fuel wood harvest. Restricting harvest in RHCAs ensures long-term retention of large woody debris sources. The mitigation measures prevent adverse effects to listed fish species and their critical habitat by limiting potential activity in RHCAs. The SFSR watershed is not as heavily targeted for firewood harvest as other areas on the Forest that are near towns and in burned areas.

Mistletoe control and pre-commercial thinning (new action)
The potential effects of this action are reduced large woody debris recruitment and possibly ground disturbance related to accessing areas for treatment. Pre-commercial thinning may actually increase the recruitment of large woody debris over time by increasing the growth rate of the remaining stand. Trees fallen as part of mistletoe control work will be left on site

if required to meet wood recruitment needs. Establishment of RHCA buffers, and following the criteria for harvest within buffers will reduce the likelihood of effects from this action; appropriate mitigation measures are included in the definition of the action.

Road management (ongoing, with previous consultation record)
The potential effects of this action are fine sediment input and reductions in large woody debris levels. Following PACFISH guidelines and the specific guidelines for conducting road maintenance activities listed in this BA will avoid adverse effects to listed fish or their habitat. Effects from a lack of road maintenance in specific areas is addressed under the road management action. Specific areas of concern have been identified and corrective actions are being pursued. This includes addressing sediment delivery from the Davis Ranch road in this analysis area.

Trails, recreation and administrative site operation and maintenance (ongoing, with previous consultation record)
The potential effects of this action are fine sediment input and reductions in large woody debris levels. Following PACFISH guidelines will avoid adverse effects to listed fish or their habitat. Trail maintenance activities have reduced sources of erosion in specific locations, reducing potential effects to fish habitat (M. Faurot, Krassel Ranger District fishery biologist, pers. comm.) Continuation of this action will prevent adverse effects to listed fish and their critical habitat; all needed mitigation measures are part of the definition of the action.

Travel Plan (ongoing, with previous consultation record)
Allowing access to the Forest could result in any of the general effects described above. Access allowed under the Travel Plan, and inappropriate access not authorized under the plan, have the potential to adversely affect critical habitat and deliver sediment to streams and can potentially lead to harassment of fish if vehicles cross streams. Known areas of conflict are addressed in this BA, so that, with mitigation, the action will avoid adverse effects. But the additional mitigation measures identified as part of this action need to be in place to avoid or reduce adverse effects to listed fish species and their critical habitat (see D. Secesh subwatershed, and E. Upper SFSR subwatershed, below).

The land exchange would put additional acres of land that are adjacent to the lower SFSR under the jurisdiction of the USFS. This would provide additional protection of the listed fish and critical habitat.

Watershed improvements and maintenance (ongoing, with previous consultation record)
Potential effects from these activities are localized areas of restoration and long-term reductions in sediment delivery and improved hydrologic function. Short-term increases in sediment delivery could occur. Timing restrictions and an appropriate level of erosion control are intended to prevent adverse effects. Results from activities allowed under this action leading to restored hydrologic function will benefit the listed species in the long term. In some cases, activities carried out under this action mitigate previous adverse effects. Mitigation measures designed to minimize short term deleterious effects are included in the definition of the action. The required mitigation is expected to prevent any adverse effects to listed fish species or their critical habitat. Lund and Burns (1994b) identified improvement of

subwatersheds from this action: "...the main effect is sediment reduction into tributaries and mainstem reaches of the SFSR... short-term effects are estimated to be neutral.... Habitat is expected to improve by eventual reduction of fine sediments in spawning gravel..." Mitigation measures incorporated into this action reduce potential short-term sediment delivery during project implementation.

Wildland fire suppression (new action)
The potential effects of this action are described above in section V.A.3., direct and indirect effects of fire. By applying the required mitigation measures, adverse effects to the listed species or their critical habitat will be avoided.

Specific actions in the Lower SFSR Analysis area:

Mackay Bar irrigation and hydroelectric diversion extension of SUP (ongoing, with previous consultation record)
Effects of issuing a temporary permit were previously described in Faurot & Burns (1998a and b). Since that time, additional analyses and fish surveys have been performed, leading to additional analysis of effects.

Snorkel surveys by IDFG in September 1999 found steelhead (51- >151 mm) and one cutthroat trout. The lower 3300 feet of Smith Creek, on private land, were snorkeled at that time (Cindy Robertson, IDFG, pers. comm.). Steelhead and cutthroat trout have been found on PNF land, above the facility in previous surveys (data on file at Payette Supervisor's Office). Chinook rearing could occur in the lower reaches of Smith Creek depending on flow conditions. Bull trout have not been found during surveys, but this does not preclude their presence.

The permitted amount of water withdrawal (2.0 cfs) is estimated to be about half of the total available base flow (see Current CD:\support documents\ reports\Mackay_Bar_Hydropower.doc). Adverse effects could occur in critical habitat for chinook and steelhead and in potential bull trout habitat because of a reduction in habitat from water withdrawals. The loss of habitat would be exacerbated in low flow years.

Other habitat indicators (LWD, pool frequency and quality, road densities, etc.) would not be affected because of the limited scope of activities allowed, and the small size and location of the facilities. Water transmission ditches, access roads, transmission lines, water lines are located away from riparian areas, except at the diversion site. New ground disturbance would not be allowed, limiting the potential for erosion and sediment delivery.

Mackay Bar Corp., Idaho Wilderness (Heaven's Gate), Wapiti Meadows, and Wiley Ranch Outfitters (ongoing, with previous consultation record)
Outfitter areas of use are spread out across the subwatersheds. Some sediment may be generated by livestock where trails cross streams. Outfitter activities do not pose a risk of chemical pollution but do have the potential for contributing nutrients to streams from human and animal wastes. The O&G actions should have a negligible effect on LWD sources, with only some firewood being gathered near camps. Mitigation measures previously added to all

outfitter/guide operations reduce or avoid adverse effects by limiting activities in RHCAs. Available monitoring information indicates that O&Gs have not adversely affected in-stream habitat and riparian vegetation (records on file in Forest Supervisor's office, McCall, ID).

2. Cumulative Effects, State and Private

The Lower SFSR subwatershed has several parcels of private land as well as several State school sections (undeveloped) and other Fish and Game owned land (timber harvest). Private land is located at the Davis Ranch (240 acres), Fritzers (60 acres), McClain Ranch (160 acres), Elk Creek Ranch (160 acres), Grouse Creek (120 acres), Hettinger Ranch (400 acres), and Badley Ranch (400 acres). Total undeveloped State land consists of 4,000 acres, while total private inholdings consist of 1,260 acres. Development has occurred mostly on private land where ranches have been subdivided, including the McClain and Badley Ranches. All of the private land could be subject to further subdividing. Private land owners are entitled to the right of reasonable access under the Alaska National Interest Lands Conservation Act (ANILCA). The State of Idaho harvested timber and reconstructed roads from the school sections from 1996-1999 (Contux timber sale).

County road maintenance practices on the Hamilton Bar Road include herbicide application in RHCAs and sidecasting of sediments from road blading. Effects of the above activities are described above.

Future actions on non-Federal land could result in local, site-specific impacts to some habitat indicators. Cumulative effects are expected to maintain or improve the existing environmental baseline at the subwatershed scale.

3. Combined Effects, Including Interrelated and Interdependent Federal Actions

The combined effect of these actions will be to move the environmental baseline towards the condition described as "functioning appropriately". A federal action which does not maintain or restore habitat indicators (which is not evaluated as an ongoing or new action in this BA) is the Federal Highways Administration Elk Creek Road Reconstruction Project, which was determined to be "Likely to Adversely Affect " listed fish species.

Using the process in USFS (1993) the potential risk of adverse cumulative effects from the multiple activities in this BA is low.

Upper South Fork Salmon River subwatershed

1. Direct and Indirect Effects from Federal Actions

In this analysis area, eight programmatic actions, two outfitter/guide operations, and activities associated with the SFSR road (including completion of the Goat Creek culvert replacement) are considered. Effects from these federal actions to individual habitat indicators were assessed using the steelhead and bull trout matrices (Appendices 4 and 5). All of the ongoing and new actions maintain indicators that are functioning appropriately, and restore or have not effect indicators functioning at risk. For bull trout, the actions would maintain subpopulation characteristics. In this analysis area, effects are largely influenced by activities associated with the SFSR road such as cut and fill slope treatments, road graveling, traffic management and culvert replacement. Mitigation was previously added to ongoing actions and to the new, programmatic actions to address potential effects.

Programmatic actions:

General effects were described above under the Lower SFSR subwatershed section.

Deviations from Wildland fire suppression activities that occurred in 2000 (i.e., unscreened intakes on water pump trucks) had negligible effects because corrective measures were taken immediately when unscreened intakes were discovered and pumping occurred over a short time period and did not involve large amounts of water.

Travel Plan
Limiting parking and traveling along the SFSR road to designated areas only, and restricting recreational floating on the lower SFSR will reduce potential effects associated with these activities. The floating restrictions are expected to be in place prior to the 2001 season. A plan to implement and enforce designated parking is also in place.

Pacific Crest Outward Bound and High Llama Wilderness Tours (ongoing with previous consultation record).
Effects of this action are similar to those from other outfitter operations described above under the Lower SFSR subwatershed section.

Goat Creek culvert replacement
This project was started in the fall of 1999 but not completed. Measures were taken to protect resources through the winter.

All listed species are present in some life stage in the SFSR near Goat Creek (data on file in Forest Supervisor's office, McCall, ID).

Sediment that has accumulated at the culvert will be removed during culvert replacement. Replacement of the culvert with an arch bridge will restore access to Goat Creek spawning and rearing habitat by eliminating the present barrier (NMFS 1993). In addition, the crossing area will be increased, and the hydraulic capacity increased from 1000 to 4000 cfs (Draft

project plans, Charlie Showers, Current CD:\support_documents\roads\SFSR_Goat_Cr_descr.doc).

A review of the draft project plans noted several concerns and recommendations (D. Gordon, former Krassel Ranger District soil scientist, Goat Creek Culvert Replacement comments, Appendix 3). These related to stream and groundwater management during construction, activities near the SFSR that may deliver sediment, and plant sources for revegetation of disturbed areas. These are addressed in the federal action description for the project in this BA, in the mitigation section.

During project implementation, sediment could be delivered to the SFSR. Use of effective, extensive BMPs (Appendix 4 of Faurot & Burns 1999), pre- approved by a journey level hydrologist or fish biologist, will minimize the amount of sediment mobilized during activities and avoid effects to listed fish and critical habitat. Mitigation measures developed in previous consultations with NMFS avoided short-term sediment loading associated with other sediment-disturbing activities on the SFSR Road (NMFS 1993). These measures have been proven in other studies to reduce sedimentation (Burroughs and King 1989, Megahan et al. 1992b, and Swift 1986), and will help avoid potential sediment delivery to stream channels.

Replacement of the culvert with an arch bridge will restore natural sediment transport in the Goat Creek system, eliminating the current sediment accumulation. Removal of road fill at the culvert would also reduce the existing mass failure risk (Burns 1992). Restoration of fish passage to Goat Creek, removing road fill and accumulated sediment in the culvert area, and restoration of natural sediment transportation patterns are provisions in the overall SFSR Road Reconstruction Project (Burns 1992).

In general, culvert removal, even with associated risk of short-term downstream sediment mobilization, is the best remedy for restoring fish passage (Reeves et al. 1991). Removal of culverts at Cabin Creek on the SFSR was completed in 1993 as part of the original SFSR Road Reconstruction Project. Fifty to seventy-five chinook salmon were observed migrating upstream in the mouth of Cabin Creek during August 1998 (N. Hershenow, PNF hydrology technician, pers. comm.). Some of the fish continued upstream to spawn in Cabin Creek. Similar results are anticipated at Goat Creek.

Sediment reduction and very little sediment movement have been associated with other culvert removal activities and associated excavation and removal of fill material at Cabin Creek on the SFSR Road (USFS 1992-1998, Appendix 4 of Faurot & Burns 1999).
Site visits during the Fourmile culvert replacement found sediment control mitigation items in place and project activities being carried out as planned. To date the new channel is functioning as expected, however the new arch has not gone through a high flow period, so its performance under such conditions hasn't been evaluated (D. Gordon, former Krassel Ranger District soil scientist, pers. comm.).

Site visits to the Goat Creek site during construction noted inadequate resource protection on the Goat Creek side of the SFSR road, which was remedied within a few days. This included

a non-functioning settling basin, poorly placed silt fence, and inadequate water management. Turbidity to the SFSR occurred at the start up of activities each day, but was not thought to contain bedload sediment or occur at a level where fish were adversely affected. The turbidity cleared up after a few hours and was not exacerbated by the inadequate mitigation mentioned above. (personal observations, and pers. comm. with C. Showers, former project engineer and D. Burns, Payette Forest fish biologist)

Snow removal
In an effort to relieve fillslopes adjacent to the SFSR from additional snow loading that could cause slope failure and sediment delivery, a strategy was developed to employ plowing methods such as: no-sidecast, using a blower, or winging the snow to the inside of the road. An interdisciplinary group identified and posted signs on approximately three miles of road where sidecasting is not to occur. Monitoring of snowplowing has been conducted by Krassel District Soil and Water personnel. It has not been determined what effect the alternative methods have had on reducing sediment into the SFSR, but the alternative methods have been implemented (correspondence between Krassel District, Payette NF, and NMFS, regarding snowplow monitoring of the SFSR Road, 1992-1999, PNF files).

Traffic management
The traffic management plan first implemented in 1995 has reduced, and will continue to reduce, the risk of a fuel spill compared to the risk for unrestricted loads by limiting loads to less than 500 gallons (USFS 1992-1998, Payette NF Annual Soil, Water and Fisheries monitoring Reports, Appendix 4 of Faurot & Burns 1999).

Cut and fillslope treatment
Stabilization of cutslopes and fillslopes has been occurring since 1992. Structural treatments (slash filters, grid structures, slab wood structures) and mulching have resulted in short-term sediment reduction, however, long-term stabilization will depend on the establishment of deep-rooted, woody plants. Eroding cut and fills have been planted, but erosion reduction directly attributable to the plantings will not be realized until the seedlings become established (USFS 1992-1998, Appendix 4 of Faurot & Burns 1999). Streambed conditions are on a trajectory of improvement: subsurface fines measured by core sampling are generally decreasing slowly in the upper mainstem SFSR (Nelson et al. 1999).

Road gravelling (One mile of McCall-Yellow Pine road from Secesh River bridge to Hamilton Bar) (Lower SFSR subwatershed)
Reductions in sediment delivered from the road surface are expected from the road gravelling, which was expected to benefit chinook salmon (Burns 1992) and the other listed species. Sediment reduction is expected from gravelling the road surface, which was expected to significantly improve egg-to-emerged fry survival of chinook salmon (NMFS 1993) and other listed species. Streambed conditions are on a trajectory of improvement: subsurface fines measured by core sampling are generally decreasing slowly in the mainstem SFSR (Nelson et al. 1999). Similar reductions are expected from further gravelling.

Interpretive signing
Interpretive signs have been posted along the SFSR Road. The content has been on salmon life cycles and the prevention of harassment and disturbance of anadromous fish (example in Appendix 4 of Faurot & Burns 1999). The signs have made visitors more aware of the listed fish in the SFSR (C. Pope, Krassel Ranger District recreation specialist, pers. comm.). Placement of additional signs should further increase awareness and lessen harassment that could result from increased river access provided by paving the road.

Stream substrate monitoring
Continued substrate monitoring has enabled the Payette NF to document an improving trend in the SFSR near the Road Reconstruction Project (Nelson et al. 1996-1999).

Inspection of BMPs
BMP treatments have generally been effective on the PNF, including the SFSR, and SFSR erosion reduction objectives have been met (USFS 1992-1998, Gordon, D., Payette NF Annual Soil, Water and Fisheries monitoring Reports, Appendix 4 of Faurot & Burns 1999). Continued inspection, prescription, and monitoring of BMPs by hydrologists and fisheries biologists should assure continued reductions in sediment mobilization from ground-disturbing actions.

The upper SFSR subwatershed is on a trajectory of improvement with respect to watershed improvement actions (Table 2, p. 20 in Faurot & Burns 1999) and sediment (Figures 1-4 on pages 24, 29,30 and Table 4, p. 25 in Faurot & Burns 1999). Monitoring of past actions for the SFSR Road Reconstruction Project has demonstrated positive effects. Proposed actions associated with the SFSR Road for the 2001-2006 period are designed to provide for reduced long-term sediment delivery, and to continue the trend of recovery. Short-term sedimentation due to ground disturbing actions will be mitigated by BMPs and absorbed by the demonstrated improved resiliency of the sediment component of fish habitat (Nelson et al. 1999).

2. Cumulative Effects, State and Private

Cumulative effects are effects of State or private activities that are reasonably certain to occur in the subwatershed where the federal action occurs. The Upper SFSR subwatershed has a parcel of private land (Reed Ranch, scheduled for exchange to the USFS) as well as a State school section (undeveloped).

Future actions on non-Federal land could result in local, site-specific impacts to some habitat indicators. Cumulative effects are expected to maintain or improve the existing environmental baseline at the subwatershed and watershed scales.

3. Combined Effects, including those from Interrelated and Interdependent Federal Actions

All of the ongoing and new actions maintain or restore each of the population and habitat indicators considered in the environmental baseline. The combined effect of these actions

will be to slowly move the environmental baseline towards the condition described as "functioning appropriately".

Using the process in USFS (1993) the potential risk of adverse cumulative effects from the multiple activities in this BA is moderate (Appendix 7). Fires burned through part of this analysis area in 2000, increasing ECA in some 6^{th} level HUs. At the analysis area scale however, the change in ECA is too small to be meaningful, and does not increase the risk of cumulative effects.

Appendix D. Public Comments / Response to Comments

Public Comments and DEQ Reply for the South Fork Salmon Subbasin Assessment Hydrologic Catalog Unit 17060208

Prepared by Craig Shepard, Boise Regional Office, Idaho Department of Environmental Quality

Table of Contents

Idaho Department of Fish & Game

Boise National Forest

Payette National Forest

Nez Perce Tribe

Environmental Protection Agency

Idaho Department of Fish & Game (IDFG)

Comments

Figures 12 & 13: Does each data point represent average measurements for a specific year, or for an average of five years? These two charts are inadequate to support the determination that beneficial uses have been fully restored throughout the subbasin. This summary of data shows no improving trend in either cobble embeddedness or percent fines.

Idaho Department of Environmental Quality Reply

Figures 12 & 13 represent the average measurements for a specific year. The data used to compile the graph were obtained from a large data set from the Boise and Payette National Forests. An appendix with this information will be prepared. DEQ disagrees with your assessment that neither graph shows improvement. It is our opinion that the cobble embeddedness data not only shows an improving trend, but it also meets the requirements set forth in the 1991 TMDL for the South Fork Salmon River.

Comment

IDFG questions the adequacy of the targets set forth in the 1991 TMDL.

Idaho Department of Environmental Quality Reply

This TMDL was approved by the Environmental Protection Agency. DEQ will keep the 1991 TMDL in place for sediment on the mainstem South Fork Salmon River. Continued monitoring is needed to determine compliance with the targets set forth in this TMDL.

Comment

IDFG is also concerned about the CERCLA removal actions remaining for several streams within the Stibnite mining district and whether it is prudent at this time to discontinue the metals TMDL.

Idaho Department of Environmental Quality Reply

The Stibnite Area Risk Evaluation Report (URS Greiner 2001) risk calculations for all metals yield hazard quotients well below 1, which essentially means that it is very unlikely that there will be any observable adverse effects due to metals in the water column.

Risk data did show several (3) detections of mercury in Meadow Creek and Sugar Creek which, when put into context of the hundreds of samples analyzed for these metals over the last twenty years, defines anomalies not exceedances.

Comment

IDFG believes it is premature to develop a water quality protection plan in lieu of revising and renewing the sediment and metals TMDLs for the South Fork Salmon River Subbasin.

Idaho Department of Environmental Quality Reply

DEQ will keep the 1991 TMDL in place for sediment on the mainstem South Fork Salmon River. Continued monitoring is needed to determine compliance with the targets set forth in this TMDL.

Comment

Table 16 should show summer chinook salmon spawning starting earlier, on approximately August 10.

Idaho Department of Environmental Quality Reply

This table will be revised in the final document.

Boise and Payette National Forests

Comment

The forest service suggests that the rationale to support listing status (for temperature) should be clarified and expanded. All available data should be accurately assessed and displayed before a final determination on such a major issue as listing status.

Idaho Department of Environmental Quality Reply

Other than one liaison from the Cascade Ranger District of the Boise National Forest, Forest Service "resource specialists" were not available during the development of this document. However, the DEQ was required to proceed with the analysis in order to meet the court approved TMDL schedule. DEQ TMDL specialists are, and have been, available to discuss the document and SBA results with Forest Service personnel.

Comment

The SBA should clarify designated beneficial uses (those listed in Table 2 do not reflect on-the-ground conditions) and how waterbodies not assessed in the document will be addressed in the future.

Idaho Department of Environmental Quality Reply

The designated beneficial uses listed in Table 2 reflect for the most part monitored streams. If the Forest Service has data to suggest changes in the designations, it should be submitted to the DEQ for consideration.

Comment

A Water Quality Protection Plan is not necessary to continue to maintain and improve water quality in the South Fork Salmon River. As identified in the SBA (section 3.1), numerous policies are in place to ensure the existing water quality is not degraded by land management activities.

Idaho Department of Environmental Quality Reply

DEQ will keep the 1991 TMDL in place for sediment on the mainstem South Fork Salmon River. Continued monitoring is needed to determine compliance with the targets set forth in this TMDL.

Nez Perce Tribe

Comments

Of major concern to the tribe is the continued reliance this subbasin assessment places on the 1996 Waterbody Assessment Guidance (WBAG). The Tribe recommends that DEQ postpone finalization of this document pending approval of the new assessment guidance. Compromising the scientific and legal defensibility of a decision not to pursue a TMDL for sediment in order to meet the TMDL schedule is not consistent with the goals of the Clean Water Act.

Idaho Department of Environmental Quality Reply

In accordance with an agreement with the Environmental Protection Agency in March 2000, DEQ will conduct subbasin assessments using all data collected since 1993 plus all other existing data from outside sources. This agreement was necessary to keep the court ordered pace of SBA/TMDL development while the new WBAG was being developed.

DEQ will keep the 1991 TMDL in place for sediment on the mainstem South Fork Salmon River. Continued monitoring is needed to determine compliance with the targets set forth in this TMDL. However, DEQ is satisfied with the data available for all other segments assessed in the document and is confident that the streams in the subbasin proposed for de-listing, with the exception of the mainstem, fully support their beneficial uses.

Comment

Tables 20 and 21 do not support the conclusion that salmonid spawning is fully supported.

Idaho Department of Environmental Quality Reply

When using the DEQ criteria for support of salmonid spawning, the total of all salmonid species are used. For example, Pony and Elk Creek are categorized as full support based on the presence of chinook, steelhead, cutthroat and Bull trout which include young of the year + 3 age classes.

Comment

The Tribe commented on turbidity within the subbasin.

Idaho Department of Environmental Quality Reply

DEQ is confident that turbidity is not impairing the designated beneficial uses of the South Fork Salmon River.

Comment

The Tribe commented on temperature within the subbasin.

Idaho Department of Environmental Quality Reply

As stated on page 47 of the document, the streams listed in Table 26 will placed on the 303 (d) list for exceedences of the federal bull trout temperature standard.

Comment

The Tribe suggests that doing a TMDL for sediment would accomplish the same goals as a Water Quality Protection Plan.

Idaho Department of Environmental Quality Reply

DEQ will keep the 1991 TMDL in place for sediment on the mainstem South Fork Salmon River. Continued monitoring is needed to determine compliance with the targets set forth in this TMDL.

Environmental Protection Agency

Comment

The EPA suggested that DEQ provide more detail concerning the “natural conditions” provision in the state water quality standards.

Idaho Department of Environmental Quality Reply

DEQ will add appropriate language to the document.

Comment

Salmonid spawning periods in the document do not appear in the water quality standards, nor are they the same published in a memo by Chris Mebane (2000). The table should include the federal Bull trout criteria. The 90th percentile air temperature provision applies only to state temperature criteria and not the federal criteria.

Idaho Department of Environmental Quality Reply

The salmonid spawning periods in the document were obtained from the Idaho Department of Fish & Game. Federal Bull trout criteria will be added to the table. DEQ will add clarifying language concerning application of criteria.

Comment

The conclusion that the EFSF can be de-listed is not supported by the information presented. We understand criteria exceedances still occur, primarily during spring high flows. We recommend separately evaluating metals concentrations during high flow months (roughly May-July) when high flows and metals concentrations coincide with sensitive life stages of chinook salmon. It would be helpful to discuss effects from other mines in the area such as Cinnabar.

Idaho Department of Environmental Quality Reply

The Stibnite Area Risk Evaluation Report (URS Greiner 2001) risk calculations for all metals yield hazard quotients well below 1, which essentially means that it is very unlikely that there will be any observable adverse effects due to metals in the water column.

Risk data did show several (3) detections of mercury in Meadow Creek and Sugar Creek which, when put into context of the hundreds of samples analyzed for these metals over the last twenty years, defines anomalies not exceedances.

With regard to separately evaluating metals during high flow months, there is currently no mechanism in the state water quality standards or water body assessment guidance for this, nor is it anticipated in the future.

Within the Report, sediment was identified as the contaminant that posed a risk to aquatic communities. However, it appears that Sugar Creek and the EFSF Salmon River act as transport mechanisms for sediment. Through restoration projects at Stibnite Mine, sediment has been reduced from loads seen over the last 20 years. It has been surmised by fisheries biologists, and DEQ, that sediment continues to be produced from the Stibnite Site and are delivered far downstream to depositional areas in the South Fork of the Salmon where it

possibly contributes to the decline in volume of overwintering habitat for fish. Furthermore, due to dilution and commingling with sediment from throughout the SFSR basin, the Stibnite sediments do not pose any toxicological threat even though they may be comprised in part by mine tailings.

Cinnabar is undoubtedly a source for metals, and sediment loads associated with this source have not been adequately characterized by DEQ's ambient monitoring process, nor adequately addressed during remedial efforts by EPA and the USDA. It is obvious, even to the casual observer at the mine that it produces a substantial amount of fine sediment that contributes to the sediment problem in the lower SFSR. This load has not been evaluated.

The SFSR's most notable impacts due to mining is the loss of riparian and off channel habitat locally at the mines, and overwintering habitat in the pools used for over wintering below the confluence of the SFSR and Secesh R. Efforts to reduce sediment loads should not be reduced, but land managers and other involved agencies (including the EPA) should begin a more focused look for sources such as the Stibnite and Cinnabar mines.

Comment

It should be clarified that existing criteria are the applicable standard until such time as a "natural condition or other criteria is established by DEQ. Although not essential, it would be helpful to indicate here or in an appendix which temperature criteria apply, which were violated, and if you have summary statistics such as the % of measurements exceeding criteria.

Idaho Department of Environmental Quality Reply

DEQ will add appropriate language to the document.

Comment

- Although it may be possible to use a modeling approach to estimate "natural background conditions" for temperature, we do not believe that the analysis in the assessment is sufficient to conclude that temperatures observed within subbasin streams are a natural condition, for the following reasons:
- the analysis does not address all anthropogenic sources within the subbasin,
- equilibrium temperature theory is not a sound basis to construct the analysis, because equilibrium temperature theory is almost never achieved in nature due to the complex interaction of numerous variables effecting a stream,
- the analysis did not address cumulative impacts of anthropogenic activities within the watershed,
- temperature attainment analysis may dramatically underestimate the magnitude of the temperature response resulting from anthropogenic activities because shade is more effective in controlling the rate of heating in cooler water than in warmer water: All temperature data collected within the basin was above the criteria, and thus it may not represent valid "background condition" boundary conditions,

- the model was developed on a reach scale, which may not eliminate modeling bias, or capture complex hydrologic and thermodynamic processes, as would be true of a network scale model.

Idaho Department of Environmental Quality Reply

1) The anthropogenic impacts of shade from roads was measured and very little impacts to stream temperatures were found. No other chronic anthropogenic impacts are present within the subbasin.

2) Equilibrium temperature theory was not needed to reach the conclusion that there was essentially no anthropogenic source of heating (see response to comment 1).

3) The TMDL process is designed to address "cumulative" pollutant load, and this was looked at within the analysis. Note that analysis of pollutant load is the total extent of cumulative effects addressed in the TMDL process. The Clean Water Act allows all streams to meet minimum standards, dispersing impacts throughout a basin at a low level. So the comment is accurate. However, this analysis does not address cumulative impacts. Current EPA TMDL regulations do not address cumulative effects to fisheries. Current hydrologic and ecological theory suggests that this homogenizing of the system is itself a cumulative effect, with much more profound consequences than occasional high cumulative loads.

4) (a) The temperature data collected was above federal standards. State standards qualify exceedances based on whether anthropogenic effects contribute in a substantial way. See response to comment 1 above. (b) The specific heat of water does not change significantly with temperature, and the sun heats warm water up just as well as it does cold water. Temperature dependent heat fluxes that could be responsible for cooling the water are minor in magnitude compared to solar heating. See George Brown's classic paper on stream temperature to get an idea as to the relative magnitude of the fluxes.

5) This relatively simple model does not capture some of the complex hydrologic and thermodynamic processes. However, it does capture the most significant effects. It is more conservative than a complex model, because it does not account for cooling. The analysis was done on a reach basis, because there were only a few anthropogenic features near the stream and the streams were examined to see if those had an effect.

It is ironic that the argument used in EPA comment 5 is the same argument used by the western Washington timber industry representatives for years. More complex models capture the cooling that may occur as a stream flows through a shady area downstream of an open area. Timber industry representatives have argued that once you are downstream a few 10's of channel width, the stream recovers to background temperature. Therefore, regulating total shade is overly restrictive.

Comment

EPA included comments about the Water Body Support Status under the Narrative Sediment Standard.

Idaho Department of Environmental Quality Reply

The table provided on page 4 of the comments included a "weight of evidence" concerning salmonid spawning support status. DEQ disagrees with the interpretation of the compliance status of the 32% cobble embeddedness information provided in the SBA. It is our opinion that the cobble embeddedness data in Figure 13 not only shows an improving trend, but it also meets the requirements set forth in the 1991 TMDL for the South Fork Salmon River.

Comment

EPA suggested the following approach:

- retain the SF Salmon River in the Idaho 303(d) list (this provides recognition and incentive to continue implementation),
- move forward with developing concrete plans for additional implementation measures, such as those identified in the Water Quality Protection Plan (Section 3.2). We recommend developing these as the next phase in the implementation of the 1991 TMDL, rather than as part of a Water Quality Protection Plan,
- consider convening a panel of fisheries biologists to review the appropriateness of the 1991 sediment TMDL targets, and consider establishing different targets (e.g. "intergravel quality ") including targets which address the loss of pool volume,
- continue monitoring stream channel conditions, as currently being carried out by USFS, to provide information for the feedback loop process, and
- re-evaluate the status of the SF Salmon in 10 years.

Idaho Department of Environmental Quality Reply

DEQ will keep the 1991 TMDL in place for sediment on the mainstem South Fork Salmon River. Continued monitoring is needed to determine compliance with the targets set forth in this TMDL.